



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

PROBLEMS.

38. Proposed by L. B. FILLMAN, St. Petersburg, Pennsylvania.

The diameter of the circular base of a dome is $10=a$ feet, which is also the distance from any point on the circumference of the base to any point on the opposite side of the dome from base to apex. Find volume of dome. [See Prob. 21.—EDITOR.]

39. Proposed by J. C. GREGG, Brazil, Indiana.

Show that the curve

$$x = 9a \sin \theta - 4a \sin^2 \theta$$

$$y = -3a \cos \theta + 4a \cos^2 \theta$$

is symmetrical to the axes, and has double points and cusps: find the lengths of the arcs, (a) between the double points, (b) between a double point and a cusp, (c) and the arc connecting two cusps and not passing through a double point. [*Rice and Johnson's Integ. Cal.* (abridged), p. 176.]

MECHANICS.

Conducted by B.F.FINKEL, Kidder, Missouri. All Contributions to this department should be sent to him.

SOLUTIONS OF PROBLEMS.

15. Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.

Show that the eastward deviation of bodies falling from a great height is

$$E_d = \frac{4\pi t(H - \frac{1}{2}\Delta) \cos \phi}{3T}.$$

- II. Solution by Professor G. B. M. ZERR, A. M., Principal of High School Staunton, Virginia.

Let OZ be the axis of z , OX , the axis x , OY , the axis of y .

Let ϕ = the latitude of O ,

β = angular velocity of the earth around DO ,

Δ = excess of descent in vacuo over that of air,

T = time in seconds of siderial day,

H = height of body above the earth.

Also let OX be tangent to the meridian and OY perpendicular to it, and their positive directions respectively south and west. The velocity of the body eastward at the moment it is dropped from z , $= \beta H \cos \phi$. Now if gravity did not alter its direction, owing to the rotation of the earth, the body would describe a parabola and the easterly deviation would be $(\beta H \cos \phi)t$, where t = time of falling. But the rotation β about OD is equivalent to $\beta \sin \phi$ about